

Claims

1. A ball screw device comprising a plurality of screw shafts each having an outer circumferential surface and a spiral shaft raceway groove formed on the outer circumferential surface, a joining member for joining the screw shafts, a nut having an inner circumferential surface with a nut raceway groove opposed to the shaft raceway groove, and a plurality of balls loaded between the shaft raceway groove and the nut raceway groove, in which a screw shaft assembly is formed by joining while aligning the phases of the shaft raceway grooves of the plurality of screw shafts by the joining member and screw coupling the shaft raceway groove and the nut raceway groove of the screw shaft assembly by way of the plurality of balls.
2. A ball screw device according to claim 1 wherein the outer diameter of the joining member is made identical with or less than the diameter obtained by subtracting the diameter of the ball from the diameter of the ball pitch circle for the plurality of loaded balls.
3. A ball screw device according to claim 1 or 2, wherein the axial length of the joining member is made identical with or less than the axial length corresponding to the effective number of turns of the nut.

4. A ball screw device according to any one of claims 1 to 3, wherein

the screw shafts are joined by abutting the stepped  
5 end faces of the screw shafts and the end faces of the  
joining member

5. A ball screw device according to any one of claims 1 to 3, wherein

10 the screw shafts are joined by abutting the end faces  
of the screw shafts in the inside of the joining member.

6. A ball screw device according to any one of claims 1 to 5, wherein

15 a lubricant channel is provided to a shaft core  
portion of the screw shaft and a lubricant supply hole is  
provided to the side wall of the joining member.

7. A ball screw device according to claim 6, wherein

20 the lubricant is supplied from the lubricant supply  
hole when the nut passes over the joining member

8. A ball screw device according to claim 1, wherein

another shaft raceway groove not loaded with the balls  
25 is disposed to the plurality of screw shafts, the joining  
member is formed as a spiral coil body along the shaft

raceway groove, and the coil body is wound around another shaft raceway groove, thereby joining the screw shafts.